

Measuring and charting rainfall

This is a project to allow you to explore the way that rain falls in a small area. For this you need about 14 identical raingauges. This is a project to compare the amounts of rain collected, so you don't have to worry about how big the gauges are. Use 10 plastic ice cream tubs, or some cans (but make sure they don't have sharp edges). It is important that the containers are identical and that they are exposed in the same way (placed flat on the ground). You will also need a way of measuring the rainfall collected. A scientific measuring cylinder is best, if you can get one. Otherwise, a small kitchen measuring cup may do. The quantities of water collected may be very small.

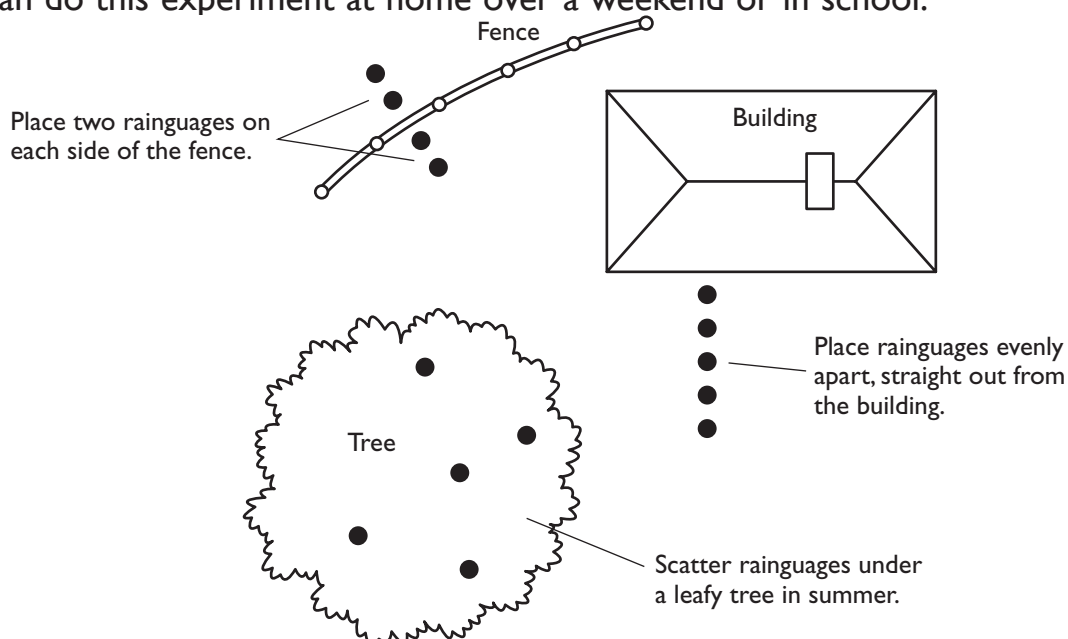
Three experiments are suggested here.

- (1) Find out how much a building shelters the ground from the rain.
- (2) Find out how rainfall varies under a leafy tree.
- (3) Find out what rainfall is like on either side of a tall wooden fence or hedge.

For each experiment choose a rainy period, so that you can collect as much rain as possible.

Discuss your requirements, and the way in which you will record and present your results, with your teacher, before you begin.

You can do this experiment at home over a weekend or in school.



Background

Investigating rainfall patterns over a local area forms the basis of a very rewarding set of projects. Essentially the objective is to investigate the shelter provided by buildings, trees and other structures.

The practical exercise on the reverse of this sheet has been left in outline form only so that you have the opportunity of discussing the project with the students, rather than letting them just follow a prescribed sheet.

The exact form the project takes will also depend on the layout of your premises, and so on. Encourage the students to get involved in thinking the project through.

(1) Start with the collecting tubs. Ask why it matters that they are all the same size and shape and exposed in the same way? This allows you to discuss how comparative readings can be made if the instruments are all the same, even if you do not use standardised equipment.

Far too many people think that worthwhile experiments can only be undertaken with specially bought equipment. This is not true. Many comparative projects cost nothing in terms of equipment and yield excellent results.

The key to all of the measurement procedure is to make sure that the results give a fair comparison.

(2) The period of time for the project is important. It is best to do it during unsettled weather when the rainfall will definitely exceed the evaporation, by a large margin, between rainy spells. Spring and autumn are often best: a day or two may be sufficient for collecting purposes. It does not matter at what time the project starts and stops, provided the start and stop times are the same for all tubs.

(3) To draw up the results for strings of raingauges, it is best to produce a side-view column chart. Get the students to measure the distances of the raingauges from the wall of the building, then plot rainfall collected against distance. In this way they will find out how far shelter might extend. Draw the results from under the tree differently, as a plan. They can simply write the value of the record in colour. Choose different colours for different amounts. In this case the objective is to show how rainfall is intercepted by trees and how it falls randomly from the leaves. Make sure you have a raingauge beyond the tree for comparison. If this experiment is repeated seasonally, the effect of leaves can also be seen.

(4) The instructions on the practical exercise say nothing about wind direction: this has been left for you to mention. Wind blowing rain towards a building will produce no effects of shelter, whilst wind blowing rain away from a building will give considerable shelter effects. You can therefore, plan with students to measure the lee as opposed to windward rainfall patterns.

(5) You may consider that it is best for students to try this project at home in their own gardens or in a friend's or relative's garden. In such locations the tubs are more likely to go untampered. Students could place a raingauge tub in their garden at home and measure the rain that fell, say, over a weekend (6pm, Friday to 6pm Sunday, for example). Then all the results can be plotted on a street map. It is possible to show the more able students how to draw isohyets (lines of equal rainfall) from this point information. More about this appears on our web site.

NOTE: Expect less rain in sheltered places, such as close to walls and in the lee of fences. Rain falls irregularly under a tree, depending on how it falls through the leaves. In summer the leaves may trap it all and no rainfall will be collected.